

WHAT IS CLAIMED:

1 1. A method for use in wireless equipment, the method comprising the steps of:
2 transmitting signals using frequency hopping over a time period T , by
3 selecting a frequency from a set of N frequencies such that over at least a
4 portion of the time period T , the frequency selection is constrained to less than
5 the N frequencies.

1 2. The method of claim 1 wherein frequency selection is done pseudo-randomly.

1 3. A method of frequency hopping for use in wireless equipment, the method
2 comprising the steps of:
3 storing a set of hopping frequencies; and
4 selecting frequencies from the set of hopping frequencies over a time period T by
5 limiting the available frequencies from the hopping set over at least a portion of the time
6 period T .

1 4. The method of claim 3 wherein the selecting step selects the frequency pseudo-
2 randomly.

1 5. A method of frequency hopping for use in wireless equipment, the method
2 comprising the steps of:
3 initializing a hopping set to a size of F frequencies, the hopping set used to select
4 therefrom hopping frequencies over a time period T ; and
5 reducing the size of the hopping set over a portion of the time period T by at least
6 one frequency.

1 6. A method of frequency hopping for use in wireless equipment, the method
2 comprising the steps of:
3 initializing a hopping set to a size of N frequencies, the hopping set used to select
4 therefrom hopping frequencies over a time period T ; and
5 selecting frequencies from the hopping set over the time period T such that at least

6 one of the selected frequencies is prohibited from subsequent selection in at least a
7 portion of the time period T .

1 7. The method of claim 6 wherein the selecting step selects the frequency pseudo-
2 randomly.

1 8. A method of frequency hopping for use in wireless equipment, where a
2 hopping set is initialized to a size of N frequencies, the hopping set used to select
3 therefrom hopping frequencies over a time period T , the method comprising the steps of:

4 determining a hopping index value;

5 modifying the hopping index value by at least the modulo of a number F , where F
6 $\leq N$;

7 selecting a hopping frequency from the hopping set as a function of the modified
8 hopping index value;

9 adjusting the order of the hopping set such that the selected hopping frequency is
10 now at a position corresponding to the value of F ;

11 reducing the value of F ; and

12 returning to the determining step.

1 9. The method of claim 8 wherein when the value of F reaches a predefined
2 minimum value, further including the step of shifting the hopping set in a cyclical
3 direction by a value equal to a difference between a predefined maximum value for F and
4 the minimum value, modulo N .

1 10. A method of frequency hopping for use in wireless equipment, the method
2 comprising the steps of:

3 initializing a hopping set to a size of N frequencies, the hopping set used to select
4 therefrom hopping frequencies over a time period T ;

5 dividing the hopping set into an allowable frequency set and a prohibited
6 frequency set;

7 selecting frequencies from the allowable frequency set; and

8 after at least one frequency selection, adjusting the membership in the allowable

9 frequency set and the prohibited frequency set.

1 11. The method of claim 10 wherein the selecting step selects the frequency
2 pseudo-randomly.

1 12. The method of claim 10 wherein membership in the allowable frequency set
2 and the prohibited frequency set at a current time is derived from knowledge of the
3 allowable frequency set and the prohibited frequency set at an earlier time.

1 13. The method of claim 10 wherein knowledge of the allowable frequency set
2 and the prohibited frequency set at a particular time is provided by one wireless endpoint
3 to the other wireless endpoint through explicit signaling.

1 14. The method of claim 10 wherein all N frequencies in the hopping set are
2 assumed allowable at pre-determined time instants.

1 15. A method of frequency hopping for use in wireless equipment, the method
2 comprising the steps of:

3 dividing a hopping set into an allowable frequency set and a prohibited frequency
4 set; and

5 transmitting information associated with the division of the hopping set to another
6 wireless endpoint.

7 16. The method of claim 15 wherein the transmitted information enables the
8 other wireless endpoint to derive the allowable frequency set.

1 17. A wireless endpoint comprising:

2 a transmitter for transmitting signals using frequency hopping over a time period
3 T ; and

4 a processor for selecting a frequency from a set of N frequencies such that over at
5 least a portion of the time period T , the frequency selection is constrained to less than the
6 N frequencies.

1 18. The wireless endpoint of claim 17 wherein frequency selection is done

2 pseudo-randomly.

1 19. A wireless endpoint comprising:
2 a memory for storing a set of hopping frequencies; and
3 a processor for selecting frequencies from the set of hopping frequencies over a
4 time period T by limiting the available frequencies from the hopping set over at least a
5 portion of the time period T .

1 20. The wireless endpoint of claim 19 wherein the processor selects the frequency
2 pseudo-randomly.

1 21. A wireless endpoint comprising:
2 a memory for storing a hopping set comprising F frequencies, the hopping set
3 used to select therefrom hopping frequencies over a time period T ; and
4 a processor for reducing the size of the hopping set over a portion of the time
5 period T by at least one frequency.

1 22. A wireless endpoint comprising:
2 a memory for storing a hopping set comprising N frequencies, the hopping set
3 used to select therefrom hopping frequencies over a time period T ; and
4 a processor for selecting frequencies from the hopping set over the time period T
5 such that at least one of the selected frequencies is prohibited from subsequent selection
6 in at least a portion of the time period T .

1 23. The wireless endpoint of claim 22 wherein the at least one selected frequency
2 is selected pseudo-randomly.

1 24. A wireless endpoint comprising:
2 a memory for storing a hopping set comprising N frequencies, the hopping set
3 used to select therefrom hopping frequencies over a time period T ; and
4 a processor for (a) determining a hopping index value, (b) modifying the hopping
5 index value by at least the modulo of a number F , where $F \leq N$, (c) selecting a hopping
6 frequency from the hopping set as a function of the modified hopping index value, (d)

7 adjusting the order of the hopping set such that the selected hopping frequency is now at a
8 position corresponding to the value of F , (e) reducing the value of F ; and (f) returning to
9 (a).

1 25. The wireless endpoint of claim 24 wherein when the value of F reaches a
2 predefined minimum value, the processor further shifts the hopping set in a cyclical
3 direction by a value equal to a difference between a predefined maximum value for F and
4 the minimum value, modulo N .

1 26. A wireless endpoint comprising:
2 a memory for storing a hopping set comprising N frequencies, the hopping set
3 used to select therefrom hopping frequencies over a time period T ; and
4 a processor for (a) dividing the hopping set into an allowable frequency set and a
5 prohibited frequency set, (b) selecting frequencies from the allowable frequency set, and
6 (c) after at least one frequency selection, adjusting the membership in the allowable
7 frequency set and the prohibited frequency set.

1 27. The wireless endpoint of claim 26 wherein the at least one selected frequency
2 is selected pseudo-randomly.

ABSTRACT

A wireless endpoint employs frequency hopping for communicating signals in a wireless communications system. Over a time period T , the wireless endpoint performs pseudo-random selection of a frequency from a hopping set of N frequencies such that
5 over at least a portion of the time period T , the frequency selection is constrained to less than the N frequencies.